

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/EP2004/008373

International filing date (day/month/year)  
23.07.2004

Priority date (day/month/year)  
28.07.2003

International Patent Classification (IPC) or both national classification and IPC  
C08B37/00

Applicant  
PACIFIC INSTITUTE OF BIOORGANIC CHEMISTRY

#### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

#### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

#### 3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/EP2004/008373

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
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**Box No. II    Priority**

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1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. V    Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	19-21
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	19-21
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

**D1:** Zvyagintseva et al.: "A new procedure for the separation of water-soluble polysaccharides from brown seaweeds", Carbohydrate Research 322, n. 1-2 (1999) pages 32-39

**1. Novelty**

D1, which is considered as the closest state of the art, discloses a process for the separation and isolation of water-soluble polysaccharides, i.e. laminarans, fucoidans and alginates, from brown seaweeds, which are known for their use in food industry and in medicine. Far-Eastern brown algae like laminaria cichorioides, Fucus evanescens and Laminaria japonica are preferably used.

Fresh or deep-frozen seaweed is first extracted with ethanol, acetone and chloroform, followed by extraction with cold 0,4% HCl and hot water. The resultant cold and hot extracts were subjected to hydrophobic chromatography in order to obtain polysaccharide fractions which were eluted with water and ethanol and precipitated with HOAc and ethanol to give alginic acid, fucoidans and laminarans (see figure 2).

The subject-matter of claim 1 therefore differs from D1 in the **step (iii)** of removing the alcohol from the alcoholic fraction obtained in step (ii) to form a concentrate comprising biologically active low molecular weight compounds, and in the **step (vi)** of adjusting the pH of the first extract of 5 to 8 to obtain a first polysaccharide fraction comprising a mixture of laminaran and fucoidan.

The subject-matter of **claims 1-18** is therefore novel over the available state of the art (Article 33(2) PCT).

However, D1 anticipates the subject-matter of **claims 19-21** (Article 33(2) PCT).

**2. Inventive step**

The problem to be solved by the present invention may therefore be regarded as to provide an alternative method for processing seaweeds to isolate laminarans, fucoidans, alginates and low molecular weight biologically active substances.

The solution proposed in claim 1 of the present application is considered to involve an inventive step (Article 33(3) PCT).

The skilled person would not have been prompted to modify the known separation and isolation process to come to the claimed process, neither from D1 alone nor when taken in combination with any of the documents cited in the International Search Report.

Claims 2-18 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to inventive step (Article 33(3) PCT).

### **3. Industrial applicability**

**3.1.** The subject-matter of present **claims 1-18** appears to comply with the requirements of industrial applicability as stipulated in Article 33(4) PCT.

**3.2.** For the assessment of the present **claims 19-21** on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.